Proposal to Construct a Regional Dedicated Network to Support Telemedicine Services in Rural Pennsylvania

Respectfully submitted to

Federal Communications Commission (FCC)

by

Pennsylvania Mountains Healthcare Alliance (PMHA)

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Overview

The Pennsylvania Mountain Healthcare Alliance (PMHA) is a consortium of twelve (12) rural hospitals dedicated to enhancing the ability of its members to provide patient-centered, community-based care and to maintain their status as independent community hospitals. PMHA is proposing to construct and deploy a dedicated network to support telemedicine services in an 18-county region of rural Pennsylvania. To achieve this, PMHA is applying for participation in the pilot program of the Federal Communications Commission (FCC) for the rural health care (RHC) funding mechanism. PMHA covers the mountainous region on the eastern edge of the northern Appalachian Mountain range. PMHA members are all located in rural counties and are often the sole hospital providers within their counties. The primary service areas of the PMHA member hospitals exceed 600,000 people and cover nearly 1/3 of the state of Pennsylvania geographically. Although they are independent, community-based hospitals, the PMHA members have worked together on collaborative projects through the consortium for many years.

PMHA is pursuing construction and deployment of a dedicated network to facilitate collaborative telemedicine efforts among its member hospitals. The specific goals of the proposed network are to increase efficiency and quality of existing telemedicine efforts, to address health care professional capacity issues, to improve the quality of care delivered, and to reduce the long-term costs of delivering care. The objectives of this effort include increased capacity of existing network connections at PMHA hospitals and provision of the network infrastructure to support the implementation of PMHA's data and voice communications plan, a consortium-wide tele-pharmacy project, expansion of various other applications of telemedicine, including tele-radiology, and initiation of collaborative health education efforts.

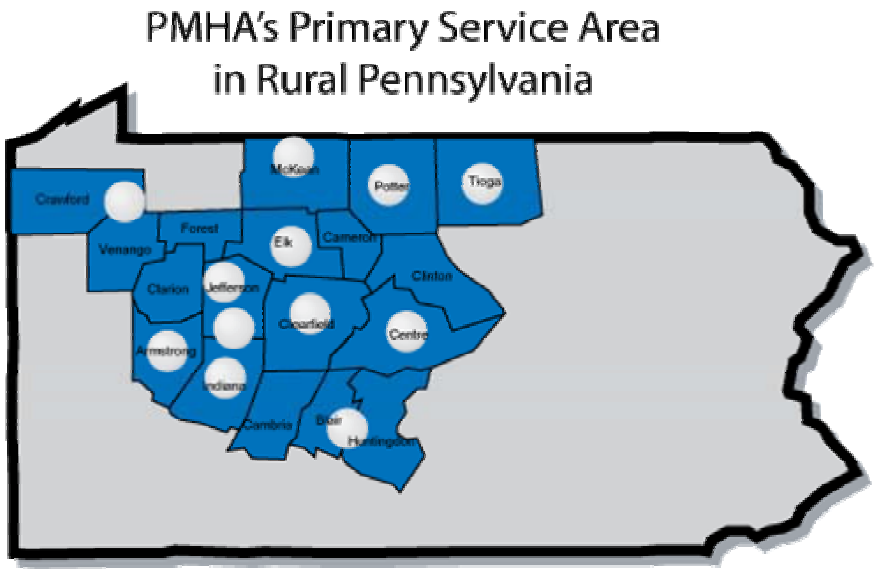
The total costs of constructing and deploying a regional broadband network of PMHA hospitals over a two-year period amount to $1,388,240. Support requested by the FCC totals to $1,180,004 over the two year period - $692,852 in project year one and $487,152 in project year two. Support for the costs not covered by the FCC to construct and deploy the network will come from identified cost savings and cost avoidances as a result of eliminating smaller capacity data circuits and cost efficiencies from the telemedicine applications that will be implemented. It is anticipated that the network will be completely self-sustaining in the long-run.

The PMHA member hospitals have extensive experience developing and implementing telemedicine programs independently within their institutions. However, they lack the necessary network infrastructure to support telemedicine applications among members. PMHA has assembled a comprehensive project management team to plan and implement this initiative. This team includes existing PMHA staff, PMHA committees of experts, and the IT human resources within the member hospitals. In addition, PennTAP, a neutral technical assistance entity, will provide support to manage the construction and deployment of the regional network.

Organizational Information and History

The Pennsylvania Mountain Healthcare Alliance (PMHA) is a consortium of twelve (12) rural hospitals dedicated to enhancing the ability of its members to provide patient-centered, community-based care and to maintain their status as independent community hospitals. PMHA is proposing to serve as the applicant organization to participate in the pilot program of the Federal Communications Commission (FCC) to examine how the rural health care (RHC) funding mechanism can enhance access to advanced telecommunications and information services for rural health care providers. If accepted to participate in the pilot program, PMHA will be the entity that is legally and financially responsible for the conduct of activities.

PMHA covers the mountainous region on the eastern edge of the northern Appalachian Mountain range. PMHA member hospitals include Armstrong County Memorial Hospital, Bradford Regional Medical Center, Brookville Hospital, Charles Cole Memorial Hospital, Clearfield Hospital, Elk Regional Health System, Indiana Regional Medical Center, Laurel Health System, Mount Nittany Medical Center, Nason Hospital, Punxsutawney Area Hospital, and Titusville Area Hospital.



PMHA members are all located in rural counties and span an area of eleven (11) counties. In many instances, PMHA members are the sole hospital providers within their counties. The primary service areas of the PMHA member hospitals exceed 600,000 people and cover 18 counties, representing nearly 1/3 of the state of Pennsylvania geographically. *(See map above for PMHA's primary service area. Member hospital locations are denoted by white circles on the map.)* The PMHA members are located in counties characterized by poverty, low levels of income, and unemployment. Based on data from the U.S. Census Bureau, all 11 PMHA counties have median household income levels that are significantly less than the state average.

In addition, all of the counties except one have poverty rates and unemployment rates that are higher than the state average *(see table below)*.

Economic Status of PMHA Counties

County	Population	Median Household Income (PA Avg. $42,952)	Unemployment Rate (PA Avg. 5.0)	Persons Living Below Poverty (PA Avg. 10.6)
Armstrong	72,392	$34,478	6.1	11.1
Blair	129,144	$34,224	5.2	12.3
Centre	135,758	$37,569	3.8	11.5
Clearfield	83,382	$32,960	5.9	12.8
Crawford	90,366	$33,914	5.8	12.3
Elk	35,112	$39,376	5.1	8.2
Indiana	89,605	$32,443	5.3	14.2
Jefferson	45,932	$32,882	5.5	11.7
McKean	45,936	$34,402	5.6	12.6
Potter	46,302	$35,003	6.5	11.5
Tioga	41,373	$33,054	5.8	12.0

Source: U.S. Census Bureau, State and County QuickFacts, http://quickfacts.census.gov/qfd/states/42000.html

Common to the service areas of each hospital is the limited access to public transportation. In addition to mountainous terrain, harsh winters, commonly resulting in 3-4 feet of snow per year and below freezing temperatures, are the norm. As a result, travel to urban hospitals, normally taking 2-3 hours one-way in good weather, can be difficult. The limits of geography, lack of transportation, and poverty combine to create access of care issues in the rural areas served by the PMHA hospitals. The PMHA hospitals serve an important role as often the sole provider of health care in these rural communities.

The current hospital members of PMHA have grown together out of common interests and experiences. The history of each member hospital reflects the time when concerned community leaders came together to create community-based healthcare facilities where residents could receive care without traveling hours to urban centers. In recent years, these small hospitals have experienced many of the same constraints which have placed increased financial pressure upon small rural hospitals. It became increasingly apparent that what appeared to work well in the cities had not translated effectively to mountainous rural areas. Fortunately, these hospitals have been innovative in sustaining services and meeting the needs of their communities. They are key participants in their community networks of health and human services.

PMHA has been in operation since 1996. It began with a group of seven (7) small rural hospitals located in the north central mountains of Pennsylvania meeting and brainstorming to discuss ways to work together. Prompted by the hospital closings and

consolidations throughout the nation, these proactive hospitals, with the support of their community boards of directors, came together with a common mission to remain community-based, viable, and significant components of their community health care delivery systems. While each is integral in the vertical healthcare networks within their communities and remain independent of the larger urban-oriented systems, the group signed a unified operating agreement to form a horizontal network. The purposes of this network are to improve health care, reduce costs, leverage effective power, benefit from economies of scale, and share best practices. Bylaws were established and PMHA incorporated in December 2006. The founding hospitals continued to meet and plan without paid staff for two years. In November 1998, the first PMHA staff members were hired. Over the past 11 years, PMHA membership has grown to its current twelve (12) members, with two (2) additional hospitals interested in membership.

The Board of Directors of PMHA is comprised of the CEO and a physician leader from each of the member institutions. The Board of Directors provides oversight and direction to PMHA to ensure the long term success and viability of the organization. In order to accomplish its varied initiatives, PMHA established several working committees in a variety of specialty areas. Each committee is chaired by an individual from one of the member institutions that has expertise in that specific specialty area.

Some of PMHA's accomplishments include the following:

- Annual Physician Education Leadership Programs since 2001 - developed in collaboration with American College of Physician Executives.
- Development of an inter-hospital peer review process and network among PMHA hospitals.
- Establishment of a best practice guideline for community-acquired pneumonia.
- Implementation of $600,000 Rural Health Network (RHN) grant to develop a central data repository for continued DRG analysis and best practice identification and development.
- Procurement and installation of videoconferencing equipment for PMHA member hospitals to facilitate more efficient meetings among members
- Initiation of the Community Hospital Alternative for Risk Transfer (CHART) initiative in 2002. CHART is a self-insurance malpractice pool with 34 unaffiliated hospitals, including 11 PMHA members.
- Creation of Administrative Services Only (ASO) in 2001. ASO is a self-insurance pool for health insurance coverage for hospital employees among 10 hospitals, including 9 PMHA members.
- Implementation of revenue cycle initiative to identify potential revenue gains for PMHA member hospitals. National revenue cycle expert hired by PMHA in May 2007 to work with PMHA members.
- Strategic value analysis to facilitate supply chain initiative among all PMHA member hospitals. Initiative to be launched in October 2007.

PMHA has proven to have tremendous value for its members. The PMHA membership in aggregate is as large as an urban institution. PMHA has successfully leveraged this collective strength to pull together the member hospitals to allow them to experience the

economic benefits common to large urban health systems. PMHA members have worked towards centralizing key functions and services through the consortium. These efforts will continue as the membership identifies additional areas of opportunity.

PMHA has made a significant financial impact benefiting the member hospitals. To date, member savings through PMHA have exceeded $8,882,400. The ASO risk pool savings is almost $7 million. Through CHART, PMHA has insulated its membership from commercial market price increases in malpractice insurance premiums, which have averaged 40-60%. Revenue cycle analysis indicates that the potential revenue gains for PMHA member hospitals in aggregate from this new initiative are approximately $50 million. In addition to direct financial benefits to member hospitals, PMHA has received and successfully managed over $1,080,000 in grants and seed money to implement collaborative projects among the member hospitals.

Telemedicine and the network infrastructure to support it have been identified by PMHA as a strategic priority of the consortium. Five (5) years ago, the PMHA MIS Committee developed a Data and Voice Communications Strategic Plan. *(See Appendix A for a copy of the strategic plan.)* This plan includes various steps to expand data and voice communications among the PMHA member hospitals by applying new communications technology and hardware. These steps include the following:

- Voice and data network analysis.
- Electronic communication lines.
- Video conferencing.
- Disaster Recovery.
- Phone switches.
- PMHA.net.
- Radiology and Pathology Digital Reads.
- PMHA Library.

Although elements of the plan were implemented, such as a voice and data network analysis and videoconferencing, the plan has never been fully implemented because sufficient network infrastructure to connect the member hospitals does not exist. Participation in the FCC pilot program will allow PMHA to construct a regional dedicated network that is vital to connect the PMHA members. This will position PMHA to implement components of the strategic plan and enhance the ability of its members to practice telemedicine.

During the Fall of 2006, the MIS Committee and the PMHA Board identified various telemedicine applications that could be implemented within and among the PMHA members if a dedicated network was constructed. Recognizing the importance of understanding the requirements of such a network and the existing infrastructure at each PMHA hospital, the MIS Committee began to work with the Pennsylvania Technical Assistance Program (PennTAP).

Since 1965, the Pennsylvania Technical Assistance Program (PennTAP) has served Pennsylvania businesses and organizations with technology-based economic development consultations. PennTAP is one of the nation's first technical assistance programs and remains a credible and valuable resource for helping Pennsylvania companies compete and grow by providing a limited amount of free technology assistance to help resolve specific technical needs. The Pennsylvania State University provides PennTAP as one of its many outreach efforts in an effort to meet its obligation as a land grant institution. The services of PennTAP staff are confidential and provided at no cost to Pennsylvania firms.

PennTAP was engaged to conduct a network assessment and design study to prepare for the construction and deployment of a regional broadband network of PMHA hospitals. Each hospital was evaluated through a site visit and an interview process. Detailed network diagrams were reviewed where available and key resources were documented. Where network diagrams were not available, they were generated by PennTAP.

The objectives of the network assessment and design study included the following:

1. Assess each hospital's existing networks to determine:
    a. Communication protocols;
    b. Border hardware;
    c. Primary switching equipment;
    d. Bandwidth for Internet; and
    e. Bandwidth for other dedicated needs.
2. Collect software similarities and differences.
3. Recommend best practice solutions for the PMHA network.
4. Perform preliminary vendor evaluation and network pricing estimates.

The network assessment and design study provided PMHA with valuable information to move it further toward the creation of a dedicated regional network of member hospitals. The recommendations of the study are integral to PMHA's request to participate in the FCC's pilot program. *(See Appendix B for the findings of the network assessment and design study.)*

Goals and Objectives

To build upon the work of PMHA over the past several years and based on the results of the network assessment and design study, PMHA is applying for participation in the FCC's pilot program for the RHC funding mechanism.

The overall goal of this effort proposed by PMHA is to create a dedicated regional broadband network of PMHA member hospitals to facilitate collaborative telemedicine practices to serve residents of an 18-county region in rural Pennsylvania. The specific goals include the following:

- Increase the efficiency and quality of existing telemedicine efforts in the member hospitals.
- Address capacity issues related to the shortage of health care professionals in specific specialties in the member hospitals.
- Improve quality of care delivered to patients by providing access to a range of health care providers and services that one individual hospital in the network cannot provide alone.
- Reduce long-term costs of delivering care due to increase efficiencies associated with telemedicine applications.

The objectives of this effort are as follows:

- Increase capacity of existing internal and external network connections at PMHA member hospitals.
- Provide network infrastructure to support the PMHA Pharmacy Committee's efforts to implement tele-pharmacy among PMHA member hospitals.
- Provide network infrastructure to support implementation of PMHA's Data and Voice Communications strategic plan.
- Provide network infrastructure to pursue implementation or expansion of various other applications of telemedicine identified as areas of interest by PMHA member hospitals. These include the following:
  - Tele-radiology
  - Tele-pathology
  - Tele-cardiology
  - Tele-obstetrics
  - Tele-ICU
  - Tele-Home Health Care
  - Tele-Wound Care
  - Tele-Lab
  - Tele-Transcription
- Provide network infrastructure to support collaborative health education efforts being jointly planned by the PMHA Human Resources and Nurse Executives Committees.

PMHA hospitals need a mechanism to facilitate hospital collaboration, reduce operating expenses, and leverage new and existing technologies. Bandwidth needs among the hospitals will continue to increase in the future. The PMHA hospitals need high capacity networks to aggregate demand for data and voice cost effectively. They also need high quality, redundant connectivity and flexibility and speed in upgrading or downgrading services. A dedicated regional broadband network of PMHA hospitals will meet these needs. It will also provide opportunities for the consortium to centralize Internet and data services, aggregate telecommunications services, and facilitate telemedicine practices among the PMHA hospitals. The network will be used initially by participating hospitals to share remote pharmacists, share internal radiologists, and share IT applications, such as picture archiving and communication system (PACS) and centralized data backup.

Participation in the FCC pilot program will help PMHA achieve its identified goals and objectives. It will also provide the FCC with the opportunity to understand the issues involved in deploying a regional broadband network among a group of independent, rural, community-based hospitals and how enhanced access to advanced telecommunications and information services can improve the delivery of health care in the region served by these hospitals.

Projected Costs

The proposed dedicated network for PMHA will cost a total of $1,388,240 over the proposed two-year period of the FCC pilot pogrom. Annual network costs will be $573,120 per year, with additional one-time startup costs during the first year of $242,000 in network equipment, installation and internal cabling costs. *(See tables that follow for a breakdown of these costs.)* These costs will provide the installation of dedicated synchronous optical network (SONET) connectivity where available throughout the PMHA hospitals. At this time, it is believed that 10 of 12 participating locations will be able to obtain these services. At the remaining locations, copper or wireless “point to point” resources will be utilized. Services will be provided to establish a minimum of 10 Mbps Dedicated Point to Point Ethernet connectivity between the hospitals. This will provide the primary means of communication for telemedicine efforts within PMHA. Additionally, 10 Mbps Internet Access with VPN connectivity will provide a backup network path for PMHA communications as well as optimal access for those 3rd party services external to PMHA. Currently, PMHA hospitals pay in excess of $168,000/year in Internet access (generally for 1.5 or 3 Mbps circuits) and other dedicated network resources. Implementation of the proposed network will mostly if not completely phase out these costs over the next two years. These cost avoidances will offset a portion of the ongoing network costs at the end of the pilot program support period.

	One Time Installation Costs				Annual Costs		
Facility	Entrance Costs	Equipment Costs	Firewall Costs	Total	Internet	Dedicated PTP	Total
Charles Cole Memorial Hospital	$0	$0	$7,000	$7,000	$ 23,400	$ 25,512	$ 48,912
Indiana Regional Medical Center	$0	$0	$7,000	$7,000	$ 23,400	$ 25,512	$ 48,912
Bradford Regional Medical Center	$5,000	$11,000	$7,000	$32,000	$ 23,400	$ 25,512	$ 48,912
Laurel Health System	$8,000	$11,000	$7,000	$35,000	$ 23,400	$ 25,512	$ 48,912
Pennsylvania Mountains Healthcare Alliance	$8,000	$11,000	$11,000	$39,000	$ 23,400	$ 25,512	$ 48,912
Punxsutawney Area Hospital	$8,000	$11,000	$7,000	$35,000	$ 23,400	$ 25,512	$ 48,912
Titusville Area Hospital	$10,000	$11,000	$7,000	$37,000	$ 23,400	$ 25,512	$ 48,912
Elk Regional Health System	$8,000	$11,000	$7,000	$35,000	$ 23,400	$ 25,512	$ 48,912
Brookville Hospital	$8,000	$11,000	$7,000	$35,000	$ 23,400	$ 25,512	$ 48,912
Clearfield Hospital	$8,000	$11,000	$7,000	$35,000	$ 23,400	$ 25,512	$ 48,912
Nason Hospital	$0	$3,000	$7,000	$10,000	$ 36,000	$ -	$ 36,000
Armstrong County Memorial Hospital	$0	$0	$7,000	$7,000	$ -	$ 48,000	$ 48,000
	$63,000	**$91,000**	**$88,000**	**$242,000**	**$270,000**	**$303,120**	**$ 573,120**

Cost Category	One-Time Startup Costs	Annual Costs
Entrance Costs	$ 63,000	
Network Equipment Costs	$ 91,000	
Firewall Hardware	$ 88,000	
Annual Network Costs		$ 573,120
Total Year 1st Year Costs:	**$ 242,000**	**$ 573,120**
Requested Assistance (85%)	$ 205,700	$ 487,152
PMHA Contribution (15%)	$ 36,300	$ 85,968

PMHA is requesting $692,852 in project year one through the FCC's pilot program to support the construction and deployment of the regional network of PMHA hospitals.

The remaining $122,268 required to cover the necessary network costs will be provided by PMHA and the member hospitals. PMHA will require $487,152 in project year two to support network costs, with the remaining $85,000 covered by PMHA and its members.

In project year one, PMHA will implement tele-pharmacy among the participating hospitals and several other initiatives that are in progress to reduce or eliminate the high cost of outside services provided by 3rd party contractors. The telemedicine project, utilizing remote or tele-pharmacists for the hospitals, is expected to result in an annual savings (primarily cost avoidance against outside service tele-pharmacy costs) for the PMHA consortium as a whole in excess of $260,000. The primary objective of the tele-pharmacy project is to increase pharmacist availability to 24 hours a day - 7 days a week. This availability is necessary to support a real time Medication Administration Record (eMAR) for the purposes of electronic documentation by nurses. Bedside Medication Verification (BMV) will result in improved patient safety by scanning medications that have been reviewed, entered, and profiled by a pharmacist. These savings do not include the additional benefits resulting from improved patient safety. The tele-pharmacy project will also help PMHA hospitals work toward a cost-effective solution to complying with the Joint Commission for Accreditation of Health Care Organizations (JCAHO) proposed standards for 24-hour pharmacy services.

The other PMHA telemedicine initiative that will be implemented in year one and that will produce cost savings to be committed to support the dedicated network is the sharing of internal radiologists. PMHA's current, extensive use of tele-radiology services is expected to increase. By utilizing internal resources within the member hospitals for tele-radiology, projected savings are conservatively expected to be $100,000 per year. This assumes that 3-4 hospitals within the consortium are sharing radiologists. It is anticipated that the number of hospitals that will share internal radiologists will be higher, particularly in year two of the project period. The impact of this project will lag the implementation of the network by approximately 12 months due to the current project status.

Support for the dedicated network will also come from the annual cost savings to the member hospitals by the elimination of existing smaller capacity data circuits. These cost savings are estimated to be approximately $144,000 per year.

There are a host of previously identified cost savings and process improvements expected to be implemented throughout the network which may or may not result in documentable savings. Participation in the FCC's pilot program will allow PMHA to document the additional savings that do result from deployment of the regional dedicated network. This will be valuable information for both PMHA members and the FCC as part of its pilot program.

Participating Health Care Facilities

The following eleven (11) health care facilities will be participating in the proposed network to support telemedicine services in an 18-county region in rural Pennsylvania:

- Armstrong County Memorial Hospital
- Bradford Regional Medical Center
- Brookville Hospital
- Charles Cole Memorial Hospital
- Clearfield Hospital
- Elk Regional Health System
- Indiana Regional Medical Center
- Laurel Health System
- Nason Hospital
- Punxsutawney Area Hospital
- Titusville Area Hospital

One PMHA member hospital, Mount Nittany Medical Center, will not be participating as part of this effort but will be part of a proposed network submitted under a separate application to the FCC.

In addition to the participating member hospitals, it is proposed that PMHA, as the consortium entity, participate in the proposed network. Based upon review of the federal regulations governing eligibility for universal service support for health care providers (section 54.601), PMHA contends that it meets the definition of eligible health care providers in paragraph (a)(2)(vii) as it relates to consortiums. This paragraph includes a definition of a consortium as follows: "consortium of health care providers consisting of one or more entities described in paragraphs (a)(2)(i) through (a)(2)(vi)." PMHA's membership consists entirely of not-for-profit hospitals, which are described as eligible health care providers in paragraph (a)(2)(v). If it is determined by the FCC that PMHA does not meet the definition of eligible health care providers, it is requested that the regulation be waived to permit PMHA's participation in the proposed network. PMHA, as the consortium entity and driver of collaborative efforts for the PMHA membership, is a crucial member of the dedicated broadband network proposed to be constructed. PMHA serves a primary role in the implementation of collaborative telemedicine efforts for its members, such as tele-pharmacy, as well as collaborative telehealth efforts, such as health professional education.

The following table lists the address, zipcode, Rural-Urban Commuting Area (RUCA) code, and phone number for each participating entity.

Name and Address	Zipcode	RUCA Code	Phone Number
Armstrong County Memorial Hospital One Nolte Drive Kittanning, PA	16201	4.2	724.543.8500
Bradford Regional Medical Center 116 Interstate Parkway Bradford, PA	16701	4	814.368.4143
Brookville Hospital 100 Hospital Road Brookville, PA	15825	7	814.849.2312
Charles Cole Memorial Hospital 1001 E. Second Street, U.S. Route 6 East Coudersport, PA	16915	10	814.274.9300
Clearfield Hospital 809 Turnpike Avenue Clearfield, PA	16830	4	814.765.5341
Elk Regional Health System 763 Johnsonburg Road St. Marys, PA	15857	4	814.788.8000
Indiana Regional Medical Center 835 Hospital Road Indiana, Pennsylvania	15701	4	724.357.7000
Laurel Health System 22 Walnut Street Wellsboro, PA	16901	8	570.723.0500
Nason Hospital 105 Nason Drive Roaring Spring, PA	16673	2	814.224.2141
Punxsutawney Area Hospital 81 Hillcrest Drive Punxsutawney, PA	15767	7	814.938.1800
Titusville Area Hospital 406 W. Oak Street Titusville, PA	16354	7	814.827.1851
Pennsylvania Mountains Healthcare Alliance 190 West Park Avenue, Suite 7 DuBois, PA	15801	4	814.372.2355

All of the participating PMHA hospitals are community-based, not-for-profit hospitals serving rural populations. All except one – Indiana Regional Medical Center - are considered eligible based on the definition of eligible institutions established by the Universal Services Administrative Company (USAC). Despite being considered ineligible based on the USAC definition of a rural area, Indiana Regional Medical Center will be included as a participant in the FCC pilot program as permitted according to section 254(h)(2)(A) of the Telecommunications Act. Indiana Regional Medical Center serves a predominantly rural population and is considered to be located in a rural area according to some definitions, such as the RUCA classification system. Indiana Regional Medical Center is considered an integral part of the network and the project management team, as the Chairs of both the MIS and Pharmacy Committees of PMHA are from that institution. In addition, Indiana Regional Medical Center will serve as the lead organization with PMHA to coordinate any issues with network implementation.

The participating PMHA hospitals vary in terms of bed size, number of patients served, and specific services provided. However, they share common experiences in serving rural, isolated communities, and many are the sole hospital providers in their communities. Seven (7) of the eleven (11) participating hospitals have less than 100 licensed beds, and three (3) of these hospitals have less than 50 licensed beds. All have similar missions to improve the health and well-being of the communities they serve and have long histories in their respective communities. Four (4) of the participating hospitals have been providing health care services for over 100 years. All are important players in their local communities, meeting their vital health care needs and serving as key sources of employment and economic development. *(See Appendix C for more information on each of the participating PMHA hospitals).*

Independently, each PMHA hospital is unable to support the network infrastructure required to enhance its telemedicine efforts. As small, community-based hospitals, they are unable to gain access to the telecommunications and information services they need to support advanced telemedicine applications. All of the PMHA hospitals have incorporated new technologies in their institutions to enable them to develop telemedicine programs. Collaboration through PMHA will allow the participating hospitals to take advantage of the economies of scale of joining together to increase the capacity of their existing internal and external network connections. This will help them maintain their viability and improve the range and quality of health care services that they can provide to residents of their service areas.

Telemedicine Experience

PMHA has been in the planning and development stages to implement collaborative telemedicine programs for its members for the past three (3) years. In 2004, PMHA examined the feasibility of implementing tele-pathology among the member hospitals. The Director of Tele-Pathology from the University of Pittsburgh Medical Center (UPMC) met with the PMHA Board to discuss ways to implement the practice. Tele-pathology could bring significant benefits to PMHA members, as all of the PMHA

members (except two) have only one pathologist at their facilities. Tele-pathology could allow member hospitals to share pathologists for over reads and to address coverage issues. In addition to discussion with UPMC, PMHA examined other models of tele-pathology practice, including the Rural Telemedicine and Tele-pathology Distance Learning Network of Hawaii. Despite interest on the part of member hospitals, the network infrastructure was insufficient at that time to move forward with tele-pathology in any meaningful way. Since then, focus has been on identifying ways to implement the necessary network infrastructure to support collaborative telemedicine programs among the PMHA membership.

In 2005 with support from the RHN grant, PMHA procured videoconferencing equipment for all of the member hospitals and for the PMHA headquarters. This has facilitated meetings of the PMHA committees to plan various collaborative projects. It also has facilitated telehealth applications within the member hospitals, such as distance health education and consultation with outside medical experts.

In 2006, the PMHA Pharmacy Committee began planning for ways to implement telepharmacy. The primary objective of the tele-pharmacy project is to increase pharmacist availability to 24 hours a day - 7 days a week in the member hospitals. Only one PMHA hospital currently has a 24-hour pharmacy. Most have limited or no coverage during off hours. There are several drivers that have prompted the Pharmacy Committee to initiate planning for a telepharmacy solution. PMHA member hospitals are beginning to implement Bedside Medication Verification (BMV) systems and Electronic Medication Administration Record (eMAR) systems as part of their patient safety and quality initiatives. These systems necessitate the availability of a pharmacist during off hours for review and verification, as well as a solution to enter orders 24 hours per day. Tele-pharmacy among the member hospitals offers a cost-effective way to provide 24-hour coverage. The Committee also initiated its efforts to be proactive considering the proposed standards from the JCAHO for inpatient hospitals to have a 24-hour pharmacy. Due to the shortage of pharmacists in Pennsylvania and limited financial resources, it would be challenging for the member hospitals to meet the 24-hour pharmacy requirement using traditional means.

The Pharmacy Committee has examined the North Dakota Tele-Pharmacy Project which involves 57 pharmacies, including 44 retail pharmacies and 13 hospital pharmacies. The Committee has spoken to key contacts that have implemented the project to discuss their experience and learnings. The Committee has also worked closely with PennTAP to provide information for the network assessment and design study, as part of the study focused on the infrastructure needs and costs of creating a network to support tele-pharmacy.

The PMHA Human Resources and Nurse Executives Committees have been meeting to jointly plan collaborative health education projects among the member hospitals. The Committees have identified the need for continuing education for nurses, physicians, and other health professionals in the PMHA hospitals. They have also identified a need for health career training in the communities in which they serve. The Committees are

currently planning ways for PMHA to serve as the provider of heath education for PMHA members. Considering the large geographic area served by the PMHA hospitals, a regional broadband network could facilitate consortium-wide, telehealth education.

Despite the difficulties implementing collaborative telemedicine projects among PMHA members due to inadequate inter-hospital network infrastructure, the PMHA hospitals have a broad range of experience independently developing and managing telemedicine programs. *(See Appendix D for more information on the specific telemedicine experiences of the PMHA hospitals.)* Some of the member hospitals have been managing telemedicine programs for several years, while others have implemented them more recently. Five (5) of the participating hospitals have developed and are managing five (5) or more different telemedicine programs. The most common practices in the participating hospitals include:

- Tele-radiology – All 11 hospitals.
- Tele-laboratory – 10 hospitals.
- Physician remote access – 7 hospitals.
- Education/distance learning – 5 hospitals.
- Tele-transcription – 4 hospitals.

With respect to tele-radiology, all of the hospitals are using a picture archiving and communication system (PACS) to store digital images and then transmitting these images to remote radiologists or 3rd party contracted services for coverage during off hours, when their radiologists are on vacation, or for over reads or consults. Nearly all of the hospitals are using telemedicine applications for laboratory services. Two of the PMHA hospitals share laboratory services through telemedicine applications. Many of the hospitals offer physician remote access to patient health records from their offices or homes. Distance education and tele-transcription are also being used by member hospitals. A few of the hospitals are using telemedicine applications for patient care monitoring for intensive care or home health care patients and for consultations with outside medical experts and specialists. Virtually all of the PMHA member hospitals have some form of Electronic Medical Records (EMR). They are in the process of implementing various degrees of EMR in their respective institutions. In addition, the PMHA hospitals have worked independently with urban health systems in other areas of Pennsylvania, including Pittsburgh and Erie, to implement telemedicine programs, such as tele-pathology and tele-cardiology.

The PMHA hospitals have robust internal networks for communication, data storage, and data transfer. Some have single point connections to other hospitals or dedicated circuits to 3rd partner contractors for more specific applications. All of the hospitals have videoconferencing equipment that was acquired through PMHA through the RHN grant. Internet bandwidth at each of the hospitals varies significantly as follows:

PMHA Hospital	Bandwidth
Armstrong County Memorial Hospital	10 Mbps
Bradford Regional Medical Center	6 Mbps
Brookville Hospitals	3 Mbps
Charles Cole Memorial Hospital	1.5 Mbps
Clearfield Hospital	6 Mbps
Elk Regional Health System	10 down / 2 up Mbps
Indiana Regional Medical Center	3 Mbps
Laurel Health System	6 Mbps
Nason Hospital	4 Mbps
Punxsutawney Area Hospital	1.5 Mbps
Titusville Area Hospital	6 Mbps

In addition to the extensive use of VPNs through the Internet, many PMHA hospitals utilize dedicated point to point network connections to their local medical centers, doctor's offices, and 3rd party affiliates.

The PMHA members are currently in the planning stages for various telemedicine applications. Collectively, the participating hospitals are working towards the implementation of tele-pharmacy to address the 24/7 coverage of hospital pharmacists to support the implementation of BMV and eMAR patient safety and quality initiatives in their institutions. They are also planning for the expansion of tele-radiology to allow for internal sharing of radiologists within the PMHA network and for collaborative distance health education. There is significant interest in developing a tele-pathology program among some of the consortium members. Other areas of interest among the hospitals if the regional network is deployed include tele-cardiology, consultation with outside experts, tele-home health, and tele-obstetrics.

PMHA plays a pivotal role in moving the member hospitals forward towards implementation of various telemedicine applications if the regional network is deployed. The PMHA Pharmacy Committee has discussed the possibility of offsite location of a pharmacist, possibly at the PMHA headquarters, to coordinate the telepharmacy efforts. There have also been discussions among the member hospitals about PMHA serving as a neutral location for other telemedicine applications, such as tele-pathology, to address coverage and review issues. In addition, consortium-wide telehealth education efforts would be coordinated and implemented by PMHA.

Deployment of a regional network of PMHA hospitals will provide the essential telecommunications and information infrastructure to enable the member hospitals to participate in consortium-wide collaborative projects, as well as independent efforts. It will also permit smaller scale collaborative efforts among groups of member hospitals.

The PMHA hospitals have experienced tremendous benefits from their current telemedicine programs. Telemedicine has expanded the world of caregivers to beyond

the four walls of the hospitals and into a world of second options, clinical support, investigations, education, and improved patient care. Enhancing the network capacity of the member hospitals through participation in the FCC pilot program would allow the hospitals to join together to share resources to expand their current telemedicine efforts and potentially help them reduce the costs of care, provide greater availability of services, and improve overall patient care.

Project Management Plan

The project management team to construct and deploy a regional broadband network of PMHA hospitals and the implementation of telemedicine applications among member hospitals will consist of various entities. It will include PMHA staff, PMHA Committees, PennTAP, and the IT Directors and departments at each of the member institutions. The PMHA Committees that will be involved include the Pharmacy Committee, the MIS Committee, the Human Resources Committee, and the Nurse Executives Committee. PMHA currently has five (5) staff members, with plans to expand its human resources in the near future. The Pharmacy Committee is comprised of pharmacists from the PMHA member hospitals, and the MIS Committee is comprised of the IT Directors from the hospitals. The Human Resources Committee is comprised of the HR Directors from the member hospitals, and the Nurse Executives Committee is comprised of the chief nurse executives from the hospitals. PennTAP will work closely with PMHA during the initial pilot program period to construct and deploy the regional broadband network. PennTAP is an important component of the project management team, providing outside, neutral expertise to facilitate effective and efficient deployment of the network. PennTAP resources will be available as an unbiased 3rd party to facilitate and mediate solutions to problems if they occur.

Upon acceptance into the FCC pilot program, each PMHA hospital will publish the 465 forms requesting the specified services. At the conclusion of the required 28-day posting period, each proposal received will be reviewed and the lowest cost supplier accurately meeting the specified needs will be identified and selected as the supplier of choice. Upon identification of a supplier, each hospital will submit the 466 forms to the Rural Health Care Division (RHCD) of USAC to inform RHCD of the selection of a service provider. Upon awarding of a service contract and when services begin, the hospitals will submit the 467 forms to confirm the receipt of services.

The time period to construct and deploy the regional broadband network of PMHA hospitals is estimated to be 10 months from acceptance into the FCC pilot program. Estimated delivery times will vary greatly due to the build out process required by the SONET connections. The hospital build outs will vary from 3-5 months. After a period of configuration and testing which is expected to last 6 weeks, the network will be available for service. *(See Appendix E for a detailed network deployment work plan and schedule.)*

Project management of the network installation will be overseen by the MIS Committee. Indiana Regional Medical Center will serve as the lead organization within PMHA to coordinate any issues with network implementation. In the initial period of deploying the network and implementing telemedicine applications, existing hospital resources will be used for maintaining the network shared among the hospital IT departments. As the use of the network grows through expanded telemedicine applications, PMHA will hire an IT coordinator to maintain the network as appropriate.

PMHA will assume leadership of the consortium-wide implementation of telemedicine applications. PMHA has served as the leader and manager for various collaborative projects for its members and has sufficient staff resources and experience to effectively do this. The PMHA Pharmacy and MIS Committees will be responsible for the necessary project planning to implement tele-pharmacy and expanded use of tele-radiology and other telemedicine applications among the member hospitals. The PMHA Human Resources and Nurse Executives Committees will be responsible for project planning to implement collaborative telehealth education projects. All of the PMHA Committees meet regularly. The Pharmacy and MIS Committees have been meeting monthly to plan for the telemedicine applications that will be implemented through a regional broadband network.

As previously mentioned, it is anticipated that the dedicated regional network will be constructed and deployed within a 10-month period during project year one. The respective PMHA Committees will operate under this timeframe to finalize the logistics of the tele-pharmacy and expanded tele-radiology efforts. The Pharmacy Committee is currently identifying the necessary human resources to implement a tele-pharmacy solution. It is considering remote location of pharmacists at an off-site location. Initial projections from the network assessment and design study and consultations with others who have implemented tele-pharmacy solutions indicate that this is the best alternative in terms of cost-effectiveness and quality control. The Pharmacy Committee will confirm the member institutions that will participate in the tele-pharmacy program in the initial project period and determine the staff resources that will be needed to support this implementation. The Committee will also develop the necessary policies and procedures to govern the implementation of telemedicine among the member hospitals. It is anticipated that, over time, implementation of tele-pharmacy will be consortium-wide.

There may be some delay in fully implementing the internal sharing among radiologists, as some member institutions are engaged in contracts with 3rd party organizations and may need to negotiate contract terminations or wait for the contracts to expire. The MIS Committee will facilitate discussions among the member institutions that are interested and able to implement the internal sharing of radiologists in project year one. The Committee will develop the necessary polices and procedures to govern the internal sharing of radiologists and will facilitate discussions among member hospitals about other applications of telemedicine that can be implemented during the two-year pilot program. It will also provide oversight, monitoring, and support for other uses of telemedicine that occur between member hospitals.

The Human Resources and Nurse Executives Committees are in the early stages of planning for collaborative telehealth education projects to benefit all member hospitals. As they continue the planning process, they will develop mechanisms to utilize the regional broadband network to provide education to the health professionals within the hospitals.

PMHA serves a key role in moving the member hospitals forward towards implementation of consortium-wide telemedicine applications. The PMHA headquarters will be included in the regional network and may serve as the offsite, neutral location for telemedicine applications, such as tele-pharmacy and tele-pathology. Discussions have begun regarding the feasibility of locating remote pharmacists at the PMHA headquarters or an independent site maintained by PMHA. In addition, PMHA will serve as the provider of telehealth education for personnel within the hospitals.

The PMHA member hospitals have the necessary equipment and software within their hospitals to support tele-pharmacy and tele-radiology applications. There are no additional software or hardware applications currently identified as necessary to begin shared services between the hospitals. Rather, the member hospitals need support through the FCC's pilot program to help them create the necessary network infrastructure to support their existing telemedicine efforts and expand these efforts through consortium-wide collaboration.

The PMHA hospitals will not connect to Internet2 or LambdaRail, Inc. through the regional broadband network during the two-year pilot program period. However, PMHA will consider the feasibility and cost-effectiveness of connecting to these nationwide backbone providers to benefit from advanced applications in continuing education and research. This connection can be established in the future after the regional network is deployed and utilized to facilitate telemedicine applications among the member hospitals.

Network Sustainability

A dedicated regional network of PMHA hospitals can be self-sustaining once established, primarily from cost savings and cost avoidances. Total annual cost savings are expected to be $504,000. Total annual costs for the network once constructed are $573,120. Assuming that the RHC funding mechanism continues at its current level of support (25%), costs savings combined with RHC fund support would provide adequate funding for the network to be self-sustaining. Considering that market prices for Internet connectivity are likely to decrease over time and the cost savings realized from telemedicine applications in the member hospitals is likely to increase over time, it is conceivable that the network will be able to be completely self-sustaining in the long-run.

Appendix A

PMHA Data and Voice Communications Strategic Plan

PMHA

DATA and VOICE

COMMUNICATIONS

STRATEGIC PLAN

01/02

01/17/02
Revised 12/01

1.0 Introduction

The Pennsylvania Mountains Healthcare Alliance (PMHA) is comprised of eleven hospitals; Armstrong County Memorial Hospital (Kittanning, Pa), Brookville Hospital (Brookville, Pa), Centre Community Hospital (State College, Pa), Charles Cole Memorial Hospital (Coudersport, Pa), Clearfield Hospital (Clearfield, Pa), Elk Regional Health System (St.Marys, Pa), Indiana Regional Medical Center (Indiana, Pa), Laurel Health System (Wellsboro, Pa), Nason Hospital (Roaring Springs, Pa), Punxsutawney Hospital (Punxsutawney, Pa), Titusville Hospital (Titusville, Pa), and a central office located in Dubois, Pa.
The alliance is used to help the eleven hospitals remain independent with the main focus on financial savings and maintaining a high level of patient care.

2.0 Objective

The objective of this document is to design a plan for data and voice communications between all twelve locations. This document provides a plan from installing new electronic communication lines, to the installation of new phone switches and the steps and benefits between. This plan is also designed with only the twelve current locations within PMHA. This plan will also expect our vendor of choice to support and recommend available grants and other forms of financial support.

3.0 Scope

The scope of this document is to provide PMHA with a plan to expand our data and voice communications by applying new communications technology and hardware.
This plan is originally structured for a three to five year implementation but could be reduced to a two-year implementation if the needed resources were applied.

4.0 Strategy

To grow and expand our hospitals by using the influence an eleven hospital alliance creates. The following steps are achievable as an alliance but are financially unattainable as a single hospital.

Indiana Regional Medical Center has a new large second computer room that is located in a building that is separate from the main hospital building. This computer room has the capability to house the equipment needed to operationalize this plan and thus the Indiana Regional Medical Center location will be used to house most of the data equipment.

5.0 Benefits

- Increased employee production due to faster access of resources, and utilization of newer technology.
- Sharing of critical data for the achievement of better business practices.
- Unnecessary travel eliminated through the use of video conferencing
- Cost of one voice network is less than twelve individual networks.
- One voice network outperforms twelve individual networks.
- One network handling all needed media.
- Standardization of products and services streamlines administration, functionality, and manageability of network.
- Employees trained on one network and sharing support responsibilities.
- Intra-hospital long distance costs eliminated.
- Overall long distance costs drop due to shared dedicated access.
- Maximizes long-term strategy to stay competitive with medical procedures, Internet costs and creating a best business practice scenario.
- Remote workers and offices will have secure access to data.

6.0 Proposed Step Summary

- Step 1 = **Voice and data network analysis (all facilities)**
- Step 2 = **Electronic Communication Lines**
- Step 3 = **Video conferencing**
- Step 4 **= Disaster Recovery**
- Step 5 **= Phone switches**
- Step 6 = **PMHA.net**
- Step 7 = **Radiology and Pathology Digital Reads**
- Step 8 = **PMHA Library**

6.1 Step Detail

6.1.1 Step One - Voice and data network analysis (all facilities)

The vendor of choice will visit each facility and conduct an in-depth analysis of our voice and data communications network. This analysis will include both an on-site evaluation and the additional time required for research, evaluation of information, documenting findings and preparing recommendations. The vendor will then generate a document that will serve as a roadmap for the remainder of this plan.

6.1.2 Step Two - Electronic Communication Lines

The electronic communication lines are the backbone of the entire plan and the first phase in our journey to expanded data and voice communications.
Once this phase is completed the remaining phases can be adjusted to meet the Alliance's priorities.
The electronic communication lines will connect all our sites and enable the needed data communications between all twelve locations.
The geographic location of our twelve facilities necessitates crossing several area codes. With this in mind these lines would all terminate at the PMHA central offices in Dubois.
As Internet security and quality improve we could reroute the connections to our local Internet Service Provider and use the Internet to transport our information via virtual private networks (VPN's).

6.1.3 Step Three - Video Conferencing

With the installation of the electronic communication lines completed and the purchase and installation of videoconferencing hardware all PMHA facilities would be linked together with the capability of videoconferencing.
This would save travel time and reduce non-productive time by conducting PMHA meeting via video conferencing.
Also the electronic communication lines will eliminate any additional usage charges for these videoconferences.

6.1.4 Step Four - Disaster Recovery

Provide a disaster recovery strategy, location, and hardware to each of the Meditech PMHA member hospitals.
Indiana Regional Medical Center (IRMC) currently has a Business Continuity (Disaster Recovery) Plan in place that enables the restoring of Meditech applications and Meditech databases to an alternate processor. IRMC has two computer rooms that are located in two different building on the medical center campus. The two computer rooms were designed and supplied with Meditech servers to enable each computer room to be the disaster recovery site for the other computer room. IRMC contacted several outside vendors to supply disaster recovery and discovered a fee of $ 30,000 to $ 50,000 annually with a five-year agreement.
With the installation of the electronic communication lines completed and the purchase of a pair of Meditech processors and a Clarion disk array all housed in one cabinet and located at IRMC. We can supply a business continuity or disaster recovery site for each of the Meditech PMHA member hospitals.
Details; The new Meditech servers will become production servers at the Indiana location and thus will be active and maintained. Upon a disaster at one of the Meditech sites all IRMC files

will be removed. Tapes supplied by the out of service hospital will be used to build a system that will enable the out of service hospital to provide Meditech services to their users via the installed electronic communication lines.

6.1.5 Step Five - Phone Switches

Provide telephone services to all the PMHA members.
Currently we have twelve stand-alone phone systems paying twelve different phone bills and incurring long distance charges each time we call each other.
With the installation of the electronic communication lines completed and the purchase of less than twelve phone switches we can lessen our phone charges.
This phase will also eliminate long distance charges between the PMHA member locations.

6.1.6 Step Six - PMHA.net

Create Internet access and Internet e-mail services for all PMHA members.
IRMC has installed an e-mail server at their location and currently installing a web site server.
These servers will be used to move the IRMC web page and e-mail services in-house.
These servers can also be used to host the PMHA and each of the member's web pages and possibly provide e-mail services to PMHA members.
With the installation of the electronic communication lines completed this phase will enable the members to reduce their fees for web page and e-mail hosting.

6.1.7 Step Seven – Radiology and Pathology Digital Reads

Enable the PMHA member hospital’s Radiology and Pathology departments to share resources and expertise. If a question should arise on a report or if the physician would like a second opinion, we would have the capability to consult with our PMHA colleagues. This clinical support could also be applied to coverage between the hospitals and help eliminate the contracting of outside firms.

6.1.8 Step Eight – PMHA Library

Provide a common point of storage and access for policies, procedures, protocols, and educational information for member hospitals. These documents are electronically stored and retrieved from a central location thus eliminating creating, storing, and maintaining basically the same document in eleven different hospitals. PMHA members can begin to share and standardize these documents, which should lead into the creation of a best practice scenario.

7.0 Additional Needs

Additional hardware, software, electronic communication lines, training, and support costs will be defined in an in-depth analysis of our current voice and data communications at each location conducted by our vendor of choice. Also to maintain the network and the hardware housed at IRMC we will need 1 additional FTE at Indiana. This cost should be distributed among the eleven PMHA members. The long distance charge savings and the savings generated when we move the web page and e-mail hosting in-house should justify this FTE's salary.
Other unforeseen additional needs may arise as we move through this plan.

8.0 Conclusion

If we are to continue to search for opportunities to expand our communications capabilities we need to become aggressive and look outside the box and continually ask, "Is there a better way".

Of course there are costs involved in a plan of this size but we need to collect what our current charges are and then compare not only the cost of the plan but also what are our benefits.

Appendix B

PennTAP Network Assessment and Design Study

Network Assessment and

Proposed Network Design Study

For The

Pennsylvania Mountains Healthcare Alliance (PMHA)

05-01-2007

Pennsylvania Technical Assistance Program

Gregory W. Snyder
Senior Healthcare Technical Specialist
Pennsylvania Technical Assistance Program (PennTAP)
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Executive Summary

With few exceptions, the state of the current networks can best be described as islands of connectivity (Local Area Networks-LANS) loosely connected to a large number of disparate 3rd party support entities through VPN tunnels and dedicated point to point circuits.

There is a great deal of consistency in communication protocols – virtually all TCP/IP with some hospitals supporting some legacy DECNET protocols as well. With a few minor exceptions, network hardware is more than adequate to support 100Mbps to the desktop. In most cases the networks are capable of 1Gbps between distribution points and to some other critical resources. All existing network infrastructure can easily support higher capacity external/Internet network circuits. With some minor exceptions, the networks comply with best practices for the industry as of this date.

There is no consistency in selection of Internet Service Providers (ISP) and related point to point networking services. There is no central purchasing agreement for these services. This represents a missed opportunity at the present time. More emphases should be made on aggregation and consolidation of data and voice circuits to reduce cost.

In order to support aggregation bandwidth demands and the process of data convergence that is ongoing throughout the world of networking, PennTAP recommends that a SONET network be implemented at each hospital with access to the Internet and a separate, internal, secure, dedicated network for PMHA tele-medicine and data sharing purposes. The capacity of connectivity should be provided at a minimum of 10Mbps to the Internet for each hospital and a minimum of 10Mbps between hospitals on the dedicated network.

Background

The Pennsylvania Mountains Healthcare Alliance (PMHA) has established a strategic goal to establish an organization wide shared networking capability. The intent of this network would be to share information and resources between the member hospitals in an effort to reduce cost and facilitate cooperation. In spite of this goal, PMHA has been unsuccessful in implementing this network due to high implementation cost. The Information Systems subcommittee has identified a means of potential funding for this network and requested the Pennsylvania Technical Assistance Program (PennTAP) to perform an analysis of the internal and external networking resources of each member hospital to determine what infrastructure currently exists. Furthermore, PennTAP has been requested to provide recommendations on the configuration of that network as well as the approach for implementing that network.

As of this writing, PMHA is comprised of 12 hospitals and an organizational headquarters. The 12 hospitals include:

LHS	**Laurel Health System**	**32-36 Central Avenue**	**Wellsboro, PA 16901**
CCMH	Charles Cole Memorial Hospital	1001 E. Second Street	Coudersport, PA 16915
BRMC	Bradford Regional Medical Center	116 Interstate Parkway	Bradford PA 16701
PAH	Punxsutawney Area Hospital	81 Hillcrest Drive	Punxsutawney, PA 15767
IRMC	Indiana Regional Medical Center	835 Hospital Road	Indiana, PA 15701

BH	Brookville Hospital	100 Hospital Road	Brookville, PA 15825
TAH	Titusville Area Hospital	406 West Oak Street	Titusville, PA 16354
CH	Clearfield Hospital	809 Turnpike Ave	Clearfield, PA 16830
PMHA	Pennsylvania Mountain Healthcare Alliance	West Park Ave	DuBois, PA 15801
MNMC	Mt. Nittany Medical Center	1800 East Park Avenue	State College, PA 16803
ERHS	Elk Regional Health System	763 Johnsonburg Road	St. Marys, PA 15857
NH	Nason Hospital	105 Nason Drive	Roaring Spring, PA 16673
ACMH	Armstrong County Memorial Hospital	One Nolte Drive	Kittanning, PA 16201

PMHA was organized in 1996 with a focus on helping rural, independent hospitals in Western Central Pennsylvania contain costs and remain competitive.

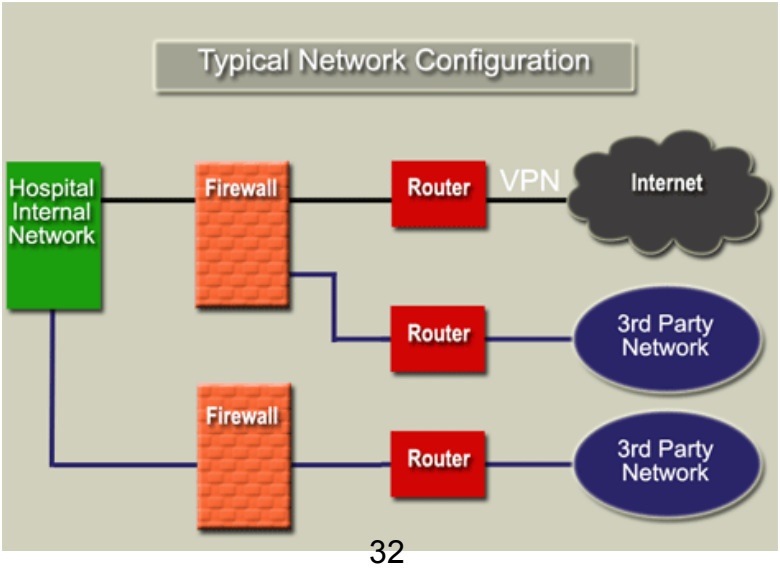
Objectives

The objectives of the network analysis and design study as presented to PennTAP prior to the start included:

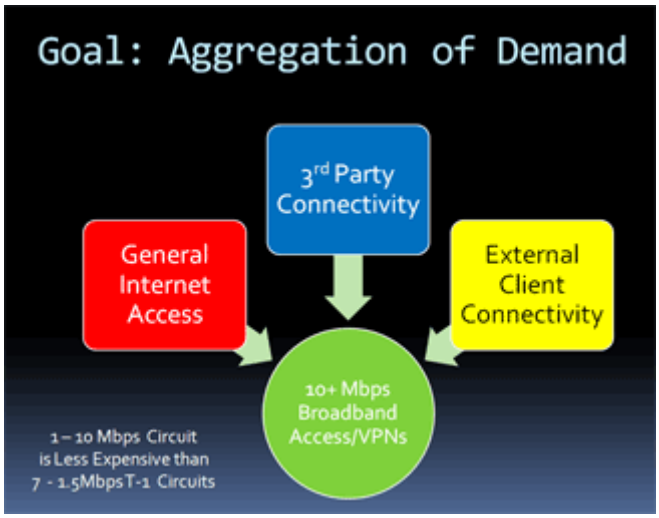
1. Assess each hospital's existing networks to determine:
    a. communication protocols,
    b. border hardware,
    c. primary switching equipment,
    d. bandwidth for Internet and
    e. bandwidth for other dedicated needs.
2. Collect software similarities and differences
3. Recommend best practices solutions for PMHA network
4. Perform preliminary vendor evaluation and network pricing estimates

Observations

With few exceptions, the state of the current networks can best be described as islands of connectivity (Local Area Networks-LANS) loosely connected to a large number of disparate 3rd party support entities through VPN tunnels and dedicated point to point circuits.

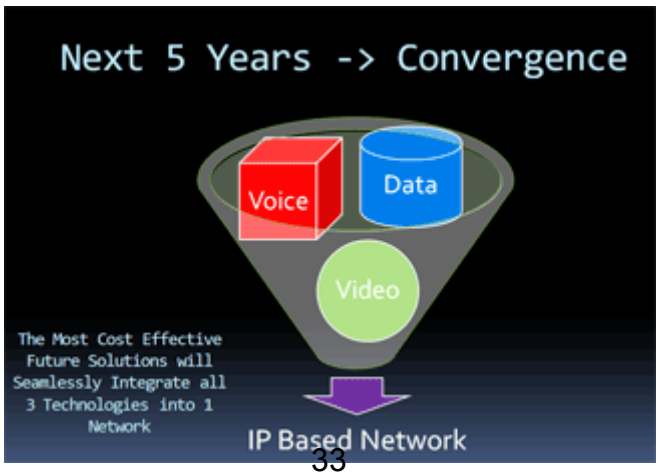


Due to contractual arrangements with 3rd party partners, this configuration is unfortunately unavoidable. There are other occasions where there is some flexibility in choosing the network configuration. Where that is the case, adding multiple firewalls, routers and dedicated circuits should be avoided in order to minimize cost and simplify network management. The goal in cost reduction is aggregating demand for services. This is very difficult if not impossible to accomplish with independent circuits and multiple data circuit providers.



There is a great deal of consistency in communication protocols – virtually all TCP/IP with some hospitals supporting some legacy DECNET protocols as well. With a few minor exceptions, network hardware is more than adequate to support 100Mbps to the desktop. In most cases the networks are capable of 1Gbps between distribution points and to some other critical resources. All existing network infrastructure can easily support higher capacity external/Internet network circuits. With some minor exceptions, the networks comply with best practices for the industry as of this date.

More emphases must be made on aggregation and consolidation of data and voice circuits to reduce cost. Most hospitals have a separate part of the organization responsible for the telecommunications (telephone) systems. This directly results in unnecessary redundancy in personnel, cabling systems and infrastructure. One, unnamed hospital, recently upgraded their facility and installed both CAT 3 (traditionally telephone) and CAT 5 (traditionally data) cabling throughout the wing. This likely added thousands of dollars in cost to the project and propagated the separation of these two systems.



Voice, data and soon to be video systems are converging. All three of these media can effectively be transmitted over the same cabling infrastructure and should ideally be managed by one portion of the organization to maximize utilization and cost reduction opportunities. Traditional phone systems (Private Branch eXchange or PBX's) will be phased out in favor or IP based (Voice Over Internet Protocol or VOIP) systems. Those organizations that recognized and align themselves with this trend will reap the most benefits in cost savings.

There is no consistency in selection of Internet Service Providers (ISP) and related point to point networking services. There is no central purchasing agreement for these services. This represents a missed opportunity at the present time.

Location	Monthly Cost	Bandwidth	ISP
LHS	$1,100	6 Mbps	Epix
CCMH	$650	1.5 Mbps	Level 3
BRMC	$3,120	7 Mbps	ABB & Sting
TAH	***	6? Mbps	Atlantic Broadband
PAH	$675	1.5 Mbps	Qwest/Line Systems
MNMC	***	3 Mbps	AT & T
IRMC	$1,284	3 Mbps	Level 3
BH	$1,280	3 Mbps	Qwest
CH	$1,987	6? Mbps	Atlantic Broadband
PMHA	***	1.5 Mbps	Comcast
ERHS	***	10/2 Mbps	Wireless PTP North Central
NH	$800	4 Mbps	Wireless PTP Windbeam
ACMH	$3,200	10 Mbps	Alltel

This equates to more than $168,000 in Internet access services. PMHA hospitals also purchase dedicated point to point access well in excess of this figure. One hospital alone spends more than $72,000/year in connectivity to its remote sites. It's difficult to identify the true **total** cost because the circuit costs are often included with other service costs such as tele-radiology and software support. An unidentified portion of these costs can be eliminated by aggregating their bandwidth and implementing VPN connectivity paths.

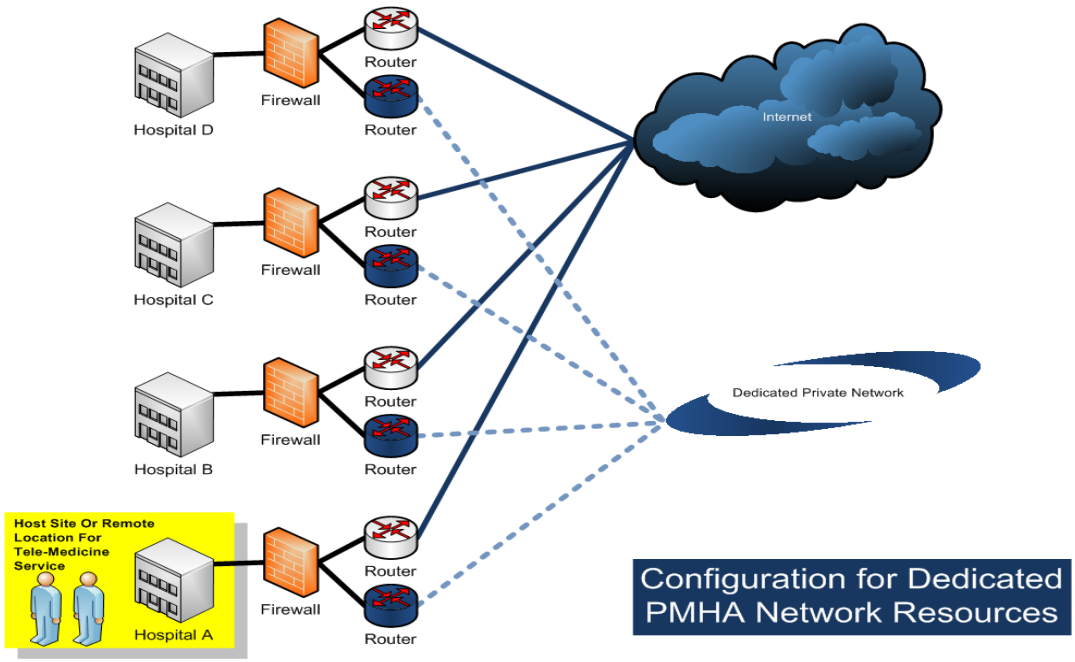
The PMHA - MIS committee recently completed an internal software assessment which is included in Addendum 1. This assessment shows a great deal of similarity and opportunity. Recently the group completed a central purchasing contract for purchases of MEDITECH software. There remains some variation between the two major types of MEDITECH implementations: MAGIC and Client-Server, however, 75% of all hospitals in the group are using one implementation or the other. This represents an opportunity for shared telemedicine resources. While each hospital has its own subtleties in operations and ancillary software tools, it will be easier to bring a departmental user working in a tele-medicine environment to bring some level of experience and exposure to MEDITECH to the experience. The long term goals for PMHA should be to, where possible, migrate toward one software application to leverage the demand with suppliers.

PMHA hospitals have implemented a variety of independent telemedicine solutions to date. The most notable and successful has been in the area of radiology. Virtually all hospitals have some type of Picture Archiving and Communication System (PACS) implementation. Most utilize a third party provider such as Nighthawk to provide coverage on "off hours" of the limited radiology staff. Most doctors within the system have some type of capability to remotely access these archives. A new area of interest is a tele-pharmacy solution for off hours of demand for pharmacists to review patient medications, address incompatibilities, and support Electronic Medication Administration Record (EMAR) and Bedside Medical Verification (BMV) efforts. A preliminary "high level" assessment of the tele-pharmacy solution was completed and included in Addendum 2 of this report.

Recommendations

The PMHA hospitals are well positioned to make the next step towards data networking integration. The MIS committee as identified the creation of a centralized PMHA data infrastructure as a high priority task in their 5 year plan. This is an absolute necessity in order to facilitate further integration and resource sharing within all of PMHA. It is critical to PMHA to support internal and external telemedicine efforts to maximize available medical resources and minimize cost.

In order to support aggregation bandwidth demands and the process of data convergence that is ongoing throughout the world of networking, PennTAP recommends that a SONET network connection be implemented at each hospital with access to the Internet and a separate, internal, secure, dedicated network for PMHA tele-medicine and data sharing purposes.



Level 3, a Tier 1 Internet organization with a significant presence in the PMHA region, was contacted for preliminary pricing on the proposed network design and deliverables. In order to leverage the overall PMHA Internet and dedicated point to point needs, a centralized purchasing contract is recommended to command better pricing for each of the member hospitals. The following is a preliminary structure offered by Level 3 to facilitate discussions.

Bandwidth	Internet	Dedicated Point to Point *Max. Price / Month	Managed Router
3 MEG	$972	$812	$150/month
6 MEG	$1,752	$1,082	$150/month
10 MEG	$1,800	$1,290	$150/month
20 MEG	$2,640	$1,976	$150/month
50 MEG	$3,800	$2,372	$150/month
100 MEG	$6,400	$3,016	$150/month

Level 3 requests a single billing point, PMHA and a minimum level of overall service (still under negotiation) committed over a 3 or 5 year period of time. Level 3 is not the only provider of services in the area and at least 3 others should be considered as well: NTT/Verio, Qwest and Verizon. The FCC Pilot Program requires a posting of requested services for quotation purposes. This would be their opportunity to provide pricing should the group be awarded funds. The costs provided above were utilized for feasibility only and should be considered maximum levels of cost. From these estimates, it is very feasible to implement the recommended network with a minimum capacity level of 10Mbps from each hospital to the Internet and 10 Mbps to a central distribution point within the network to facilitate the dedicated point to point capabilities.

Biography and Contact Information:

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IT Security Evaluations
Business Continuity Planning
Telecommunication and Network Assessments and Planning

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Prior to joining PENNTAP, Greg was a project manager with Elliance in Pittsburgh. There he worked with dozens of companies in implementing e-business initiatives, including Internet, intranet, and extranet sites. Several sites for which Greg served as project manager include Pittsburgh Mercy Health System, Dollar Bank Consumer Loan, rue21, and Independence Medical.

Prior to Elliance, Greg gained more than fifteen years of manufacturing experience with a DuBois-based gas meter manufacturer. As part of the management team, he served as manufacturing engineer, electronics manufacturing supervisor, project manager, and information technology manager.

Greg earned his bachelor's degree in industrial engineering at Penn State and is currently working on a master's degree at the University.

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Addendum 1
Provided by PMHA MIS Commettee

	Armstrong County		Bradford Regional		Brookville		Charles Cole		Clearfield Hospital		Elk Regional		Indiana Regional		Laurel Health System		Nason Hospital		Punxsutawney		Titusville	
	Installed	Projected Install	Installed	Projected Install	Installed	Projected Install	Installed	Projected Install	Installed	Projected Install	Installed	Projected Install	Installed	Projected Install	Installed	Projected Install	Installed	Projected Install	Installed	Projected Install	Installed	Projected Install
Abstracting	Meditech		Meditech		Atlas		Meditech		Siemens-Invision		Meditech		Meditech		QuadraMed		Mediqual		Meditech		Meditech	
Admissions	Meditech		Meditech		Meditech		Meditech		Siemens-Invision		Meditech		Meditech		Siemens - Soarian		Siemens - Invision		Meditech		Meditech	
Accounts Payable	Meditech		Meditech		Meditech		Meditech		Siemens-Invision		Meditech		Meditech		ESI	Converting to a new system 2007	Siemens - Invision		Meditech		Meditech	
Anti Spam	Hosted by Quest		DoubleCheck						Postini				Symantec		Spam Cobra	Investigating Replacement	Sonic Wall		Symantec			
Anti Virus	Norton		Symantec		McAfee 8.1		Symantec		Symantec		McAfee		Symantec		McAfee		Trend Micro		Symantec			
Archive												**Meditech 2008**	Blue Chip										
Authorization & Referral Management													Meditech									
Bedside Medication Verification	Meditech			**Meditech**				**Meditech 2007**			Meditech		Meditech	**Apr-07**						Investigating		Meditech
Behavioral Health			Greenfield												Siemens - Soarian							
Billing/Accounts Receivable	Meditech		Meditech		Meditech		Meditech		Siemens-Invision		Meditech		Meditech		Siemens - Soarian		Siemens - Invision		Meditech		Meditech	
Blood Bank	Meditech		Meditech				Meditech				Meditech		Cerner				Psyche Systems		Meditech			
Budgeting & Forecasting	Meditech (Not using)		Meditech				Meditech		Business Objects		Meditech				Trendstar	Converting to a new system 2007					Meditech	
Capital Budget			MS Excel										Form Fast									
Cardiac Monitors									GE		Spacelabs		Spacelabs				Spacelabs					
Chart Locator	SoftMed		Meditech						CRIS-Systems						SoftMed		SoftMed		Meditech			
Community-Wide Scheduling	Meditech		Meditech		Meditech		Meditech				Meditech		Meditech					Lotus Domino	Meditech			
Contract Management									KREG		Iatrics/Array				Soarian Reimbursement Module							
Cost Accounting			Meditech				Meditech (Not utilized)				Meditech								Meditech		Meditech	
Data Repository	Meditech		Meditech										Meditech		Siemens - Soarian Clinicals							
Data Warehouse											Shams		Meditech									
Decision Support Clinical							3M and Solucient	**Dimensional Insight 2007**			Shams		Medisolv									
Decision Support Financial	Meditech							**Dimensional Insight 2007**	Siemens PLM		Shams		Medisolv									
Dictation System	Diskriter				Diskwriter		Dictaphone		Dolby		Diskwriter	**Dolby 2007**	Dictaphone		Dolby		SoftMed		Diskwriter		Meditech	
Dietary Point of Sale															Horizon							
Drug Database			First Databank																			
Electronic Claims	Perse		Perse Claim Track		ePremis		Quadax		Siemens HDX-PreSe		Meditech		Meditech		Siemens - Soarian NDC/HDX		PerSe Epremis		Meditech		Perse	

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Emergency Department Management			Meditech		Meditech				A4 H-MED		Meditech		Meditech			Looking at Electronic T-System and MedHost			ECDS			Meditech
Encoder	3M Encoder and APC Batch		3M		3M		3M		Quadra Med Quantim		3M		Quadramed		3M		3M		nCoder			
Enterprise Medical Record	Meditech		Meditech																			
Executive Support System	Meditech		Meditech		Meditech						Meditech / Shams					System currently being			Meditech		Meditech	
Faxing Software	Interbit				Forward Advantage				ESKER BISCOM & Right Fax		Forward Avantage		Netfax		ZETAFax		Captaris / SoftMed		Forward Advantage			
Fixed Asset	Meditech		Meditech				Meditech		Sage FAS		Meditech				BEST		FAS by Best				Meditech	
Forms on line	FormFast		Adobe Jetforms	**FormFast or Access eForms**						**TBD 2007**	Access eForms		Form Fast									
General Ledger	Meditech		Meditech		Meditech		Meditech		Siemens General Accounting		Meditech		Meditech		Ross	Converting to a new system 2007	Siemens - Invision				Meditech	
Help Desk	TrackIT		Outsourced				Track-IT!		Track-it		Array		Track It		HEAT			Looking at Clientele by Epicor				
Home Health			Siemens/Delta / Novius		HHC/Alleghen y		PtCT		Beyond Now Tech.		PtCT				Siemens - Novius Home Health		HHC300		PtCT	Installing Maestro 1/2007		
Human Resource					Ceridian					**Employee E-appraisal 2007**		**Meditech 2008**	PICIS		Ross	Converting to a new system 2007	People Talk		Meditech			
Insurance Verification									HDX			**2007 No company selected**	HDX									
Internet Filtering			SonicWall						Websense		Websense		Websense		Websense	**Investigating iPrism**	Websense					
Internet Gateway							Microsoft Proxy		Atlantic Broadband			**Meditech 2007**			Direct ISP connection (EPIX)							
Laboratory	Meditech		Meditech		Meditech		Meditech		SCC SoftLab		Meditech		Cerner		Siemens - Novius Laboratory		Psyche Systems LabWeb		Meditech		Meditech	
Long Term Care			Galaxy Hosted Software was Threshold				Meditech NUR				Meditech				Keane and CareTracker for documentatio n							
MAGIC Office					Meditech		Meditech				Meditech		Meditech						Meditech		Meditech	
Material Management Pharmacy	Meditech		Meditech				Meditech				Meditech		Meditech									
Materials Management	Meditech		Meditech		Meditech		Meditech		Siemens Invision		Meditech		Meditech		ESI	Converting to a new system 2007	Siemens - Invision		Meditech		Meditech	
Medical Records	Meditech		Meditech		Meditech		Meditech		Encoder		Meditech		Meditech		Siemens - Soarian		SoftMed		Meditech		Meditech	
Microbiology	Meditech		Meditech		Meditech		Meditech		SCC SoftLab		Meditech		Cerner		Siemens - Novius Laboratory		Psyche Systems LabWeb		Meditech		Meditech	
MIS	Meditech		Meditech		Meditech		Meditech				Meditech		Meditech						Meditech		Meditech	
Non-MEDITECH Interfaces			Meditech				Quest, RODS,Oicis, Pyxis		OPENLINK		Iatrics				OpenLink		OpenLink / Quovadx		Quest, Rods, Fuji, Maestro		Atlas, Pyxis, Emed, Quest, Rods	
Optical Storage	CompuCom		A4 Health Systems / Allscripts	**Meditech, Delivery Jul 07**	Compu-com				Siemens Document Imaging				Blue Chip		LaserArc		HP/Stellant Acorde					
Report Writer	Meditech		Meditech / Access / Crystal / SQL		Meditech		Meditech NPR		Siemens AdHoc & Access		Meditech / Access		Meditech		Access, SQL, Crystal		Crystal		Meditech		Meditech	

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Nursing	Meditech	**4/1/07**	Meditech		Meditech		Meditech		Siemens COR Only		Meditech		Meditech		Siemens - Soarian Clinicals	Installing Nursing Assessment 2007				Investigating		Meditech
Operating Room Management	Meditech		Meditech		Array		Array				Array		PICIS				Per-Se Orsos		Meditech OE Based			
Order Entry	Meditech		Meditech		Meditech		Meditech		Siemens Invision		Meditech		Meditech		Siemens - Soarian Clinicals		Siemens-Invision		Meditech		Meditech	
Occupational Health	Medical Mgr		Drug Pak								Stix						Integritas Stix					
PACS	DR Systems		MTS Delft			**Phillips/ 2007**	MedWeb w/TelRad			**Amicas 2007**	Amicas		McKesson		Siemens		Dynamic Imaging		Fuji		Emed	
Paramedic Billing															AIM Paramedic Billing							
Pathology	Meditech		Meditech		Meditech		Meditech		Siemens RIS Patient Merge		Meditech		Cerner				Psyche Systems\		Meditech			
Patient Care Inquiry							Meditech				Meditech		Meditech						Meditech		Meditech	
Patient Discharge Instructions												**Meditech 2008**							Logicare			Meditech
Patient Education																			Logicare			
Payroll/Personnel	Meditech		Meditech		Meditech		Meditech		TOPPS II		Meditech		Meditech		Ross	Converting to a new system 2007	People Trak		Meditech		Meditech	
Pharmacy	Meditech		Meditech		Meditech		Meditech		Siemens Pharmacy		Meditech		Meditech		Hands On/Ascend IP		Meta Pharmacy		Meditech		Meditech	
Pharmacy Drug Formulary	Medispan		Amerisource Bergen??		Medi Span		First DataBank				Medi Span		Micromedex		Ascend IP		Meta Pharmacy			FirstData Bank	First Data Bank	
Physical Plant Door Security	DSX		Simplex		ACS		Adapt		GE Indenticard		API				C-Cure		Siemens					
Physical Plant Maintenance Tracking									Access		Array		TMS		MP2		MP2					
Physician Care Management	Meditech	**4/1/08**		**Meditech Delivery Jul 07**								**Meditech 2007**					Per-Se Concept					Meditech
Physician Office Billing			Emdeon / Medical Manager				LSS				LSS		LSS		Practice Partner, Siemens		Per-Se Concept					
Physician office EMR				**Evaluating**								**LSS 2008**			Practice Partner							
Physician Order Entry		**Meditech - 2007**										**Meditech 2007**			Practice Partner							
Policy and Procedure			.PDF on Web Pages								Policy Manager								In-House Developed			
Productivity			RPI																			
Provider Order Management		**Meditech - 2007**										**Meditech 2007**			Practice Partner							
Quality Management/Risk Management	Midas																					
Radiology	Meditech		Meditech				Meditech		Siemens Novius Radiology		Meditech		Meditech		Siemens - Novius Radiology				Meditech OE Based		Meditech	
Radiology/ITS Magic Sites								**Meditech 2007?**				**Meditech 2007 ?**										
Remote Thin Client	Citrix		Citrix						Citrix		Citrix		Citrix		Windows Terminal Services				Windows Terminal Server			

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Scanning i.e. insurance cards/face sheets	CompuCom		A4 Health Systems / Allscripts	**Meditech, Delivery Jul 07**					Siemens Document Imaging		Iatrics						Stellant					
Scanning and Archiving			A4 Health Systems / Allscripts	**Meditech, Delivery Jul 07**		**Meditech 2008-09**			Siemens Document Imaging			**Meditech 2008**					Stellant					
Scheduling (appointment)	Meditech		Meditech		Meditech		LSS & Meditech CWS		Office Hrs for Hosp Clinics		Meditech		Meditech				SCI		Meditech			
Staffing & Scheduling			Ansos				Meditech NUR		Ansos for Nursing								PerSe Ansos					
Time and Attendance	Kronos		Kronos		Kronos		Kronos		Kronos		API		Kronos				Kronos		Kronos			
Transcription	Meditech		Precyse	**Optiscript**	Meditech		Meditech		Novisu RIS and Patient Merge		Meditech		Dictaphone		Dolby		SoftMed		TSG Transcriptor		Meditech	
Hardware																						
SAN																	EMC CX500					
Other															Primarily Hewlett Packard PCs.							

Addendum 2
High Level Analysis of Tele-Pharmacy Feasibility

The goal of a tele-pharmacy solution for PMHA would be to address the needs predicated by the implementation of an Electronic Medication Administration Record (EMAR) and a Bedside Medication Verification (BMV) system. Generally, a pharmacist must be available to review all medication prescribed for a patient, review all new medications to be administered to the patient and available for consultations in case of questions with medication administration or adverse reactions. Currently hospital pharmacist availability is typically limited to 8 hours (1st shift), 10 or 12 hours (extended 1st shift) or 16 hours (1st and 2nd shift). One of the major factors to consider in providing an effective solution is the resolution of coverage hours and corresponding cost sharing model to be implemented between hospitals. These issues must ultimately be resolved by PMHA and the participating hospitals before proceeding.

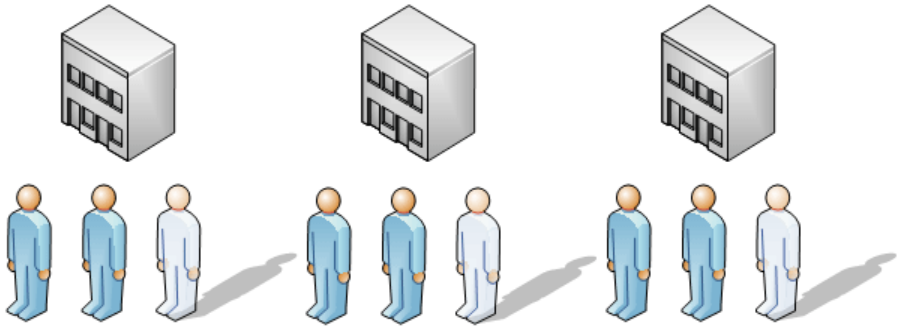
The purpose of this analysis is to provide a cursory look at the situation and determine if it is worthy of further analysis or if it should be abandoned at this point of consideration. The state of North Dakota has effectively implemented a tele-pharmacy program state wide supporting more than 44 retail and 13 hospital pharmacies. North Dakota laws are different than Pennsylvania and it is recognized that the implementation would be different. Their success though, adds credibility to a possible PMHA tele-pharmacy solution.

There are three identified solutions to consider with a general EMAR/BVM solution:

A. Hire additional staff at each of the hospitals to provide at least a 24 hour availability of a pharmacist.
B. Engage the services of a 3rd party tele-pharmacy provider to cover the off hours of the existing pharmacists.
C. Develop a PMHA tele-pharmacy solution to offer to the member hospitals.

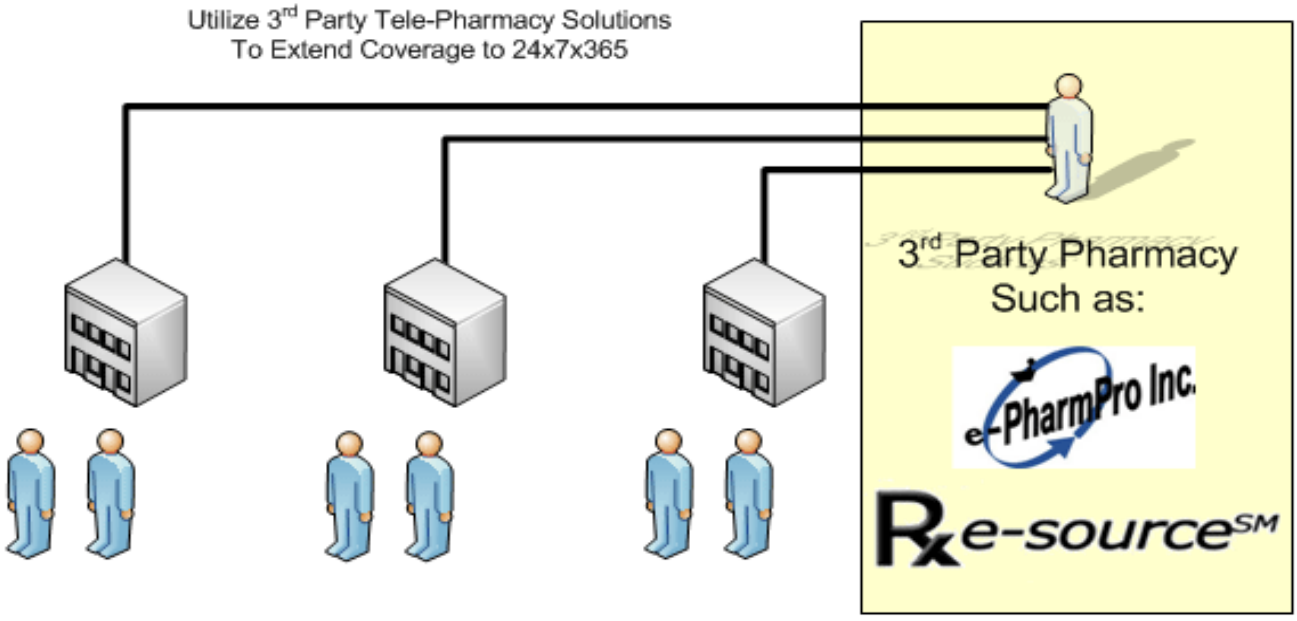
The following 3 slides attempt to illustrate these three scenarios and identify surface level issues and benefits:

Alternative A:
Hire More Pharmacists At All Hospitals
To Extend Coverage to 24x7x365



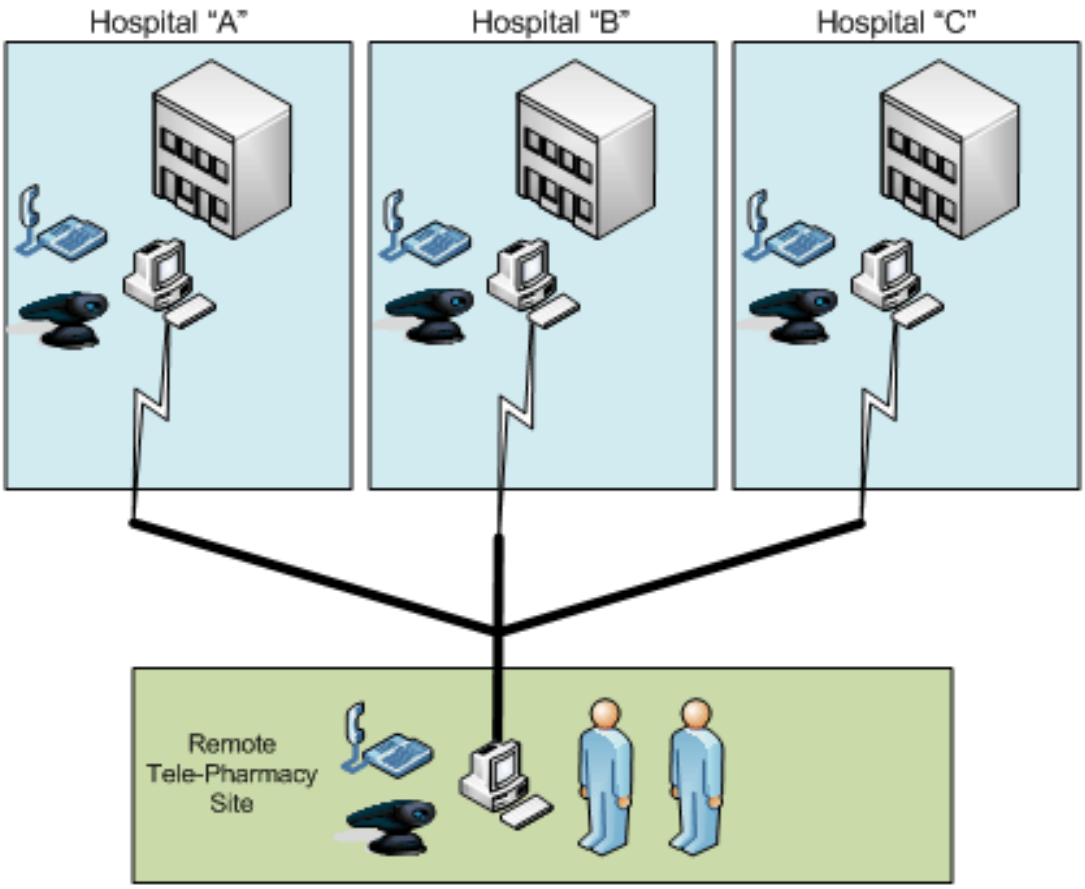
Least Desirable:
- Lack of Pharmacists
- Low Utilization on 3rd Shift
- Cost Estimate (~$70,000/year + overhead and fringe benefits one additional pharmacist would cost a net $120,000/year and still wouldn't provide full coverage)

Alternative B:
Utilize 3rd Party Tele-Pharmacy Solutions
To Extend Coverage to 24x7x365



Not Ideal:
- Not Always Available – Gaps in Service
- High Cost ($100,000 - $130,000 / hospital / year)
- Priority in Queue
- Remains to be determined if the quality of service and ability to conform with hospital policy / procedure would be acceptable.
- Are There Additional Networking Costs???

Alternative C:
Utilize Internal Tele-Pharmacy Solution
To Extend Coverage to 24x7x365



Best Alternative:

- Lowest Net Cost Per Hospital (Next Slide)
- Better Control of Quality of Service
- Able to Provide Onsite Training and Performance Review Meetings
- Able to Leverage Infrastructure for Additional Remote Diagnostic Consultations.

C	**PMHA Tele-pharmacy**	**3 Hospitals: $220K ($73K/hospital)** **Sharing 2 pharmacists. Cost projects pharmacist wage, additional overhead & fringe**	**Would probably need to pay a premium wage to attract a high quality pharmacist to work during the off hours.**
B	3rd Party Contractor	3 hospitals: $330K+ (Avg. $110K / hospital)	Based on preliminary pricing obtained by the pharmacy committee. Estimates ranged from $100-130K per hospital
A	Hiring Additional Pharmacists for each location	3 hospitals: $330K-660K at least 3-6 additional pharmacists required ($110K/ pharmacist / hospital / shift)	In reality this number would be nearly twice a great due to the number of hours needed in current average hospital schedules to cover all times.

This analysis indicates that a PMHA tele-pharmacy is worth additional consideration. It is estimated that there could be a savings of $37,000 per participating hospital compared to the next most attractive alternative.

Appendix C

PMHA Member Hospital Information

PMHA Member Hospital Information

Armstrong County Memorial Hospital

Armstrong County Memorial Hospital is a 165 bed rural non-profit community hospital located in Armstrong County, PA which is within the Appalachian Region. Armstrong County Memorial Hospital provides a full range of services some of which are unique for a community hospital. These services include the Acute Rehab Center, The Wound Healing Center, the award-winning Richard G Laube Cancer Center, the Pain Management Clinic and one of the oldest staffed inpatient psychiatric units in Western Pennsylvania. The hospital is affiliated with three primary care centers that extend to the far reaches of the county. It admits approximately 7,600 inpatients per year and sees 180,000 outpatient visits.

Armstrong County Memorial Hospital serves all of Armstrong County of which 85% is considered rural. It consists of a high elderly population with a lower per capita income and higher unemployment rate than the national average. It also has fewer people per square mile and more people below the poverty level compared to the average for the state of Pennsylvania.

Bradford Regional Medical Center

Bradford Regional Medical Center is a 109-bed state-of-the-art inpatient facility that is linked to a network of health services designed to provide the residents of McKean County, PA and surrounding communities with a continuum of care. Services provided by Bradford Regional Medical Center include home health services, a 93-bed long-term skilled nursing care, outpatient services, primary care offices, mental health services, oncology and hematology, cardiology, general and vascular surgery, and women's health. The Imaging and Vascular Services Departments boast some of the most advanced technologies available in the US today, including a new cath lab. In September 2005, the hospital broke ground on a $14.5 million building project to expand and enhance its outpatient services, including emergency medicine, oncology, cardiology, outpatient surgery and neurosciences. The new outpatient services building opened in January 2007, paving the way for Emergency Department renovations to begin.

Bradford Regional Medical Center (formerly Bradford Hospital) first opened its doors on May 10, 1887 in a remodeled farmhouse. When completed, the building housed 14 beds and had a medical staff of three physicians. It was recorded at the time as being one of the few, if not the only, hospitals available between Buffalo, NY and Pittsburgh, PA.

Brookville Hospital

Brookville Hospital is a 34 bed Critical Access Hospital located in rural Jefferson County, PA. The hospital serves a local population of approximately 25,000 people. Along with 25 Medical-Surgical and ICU beds, the hospital has a 9 bed geriatric psychiatric unit and provides a 24/7 emergency department. In addition, the hospital operates the Brookville-New Bethlehem Home Health Care Agency, several physician practices, a rural health clinic, and a walk-in clinic staffed by nurse practitioners. Employing over 300, the hospital is a major employer in this small community.

Brookville Hospital's mission is to provide quality healthcare services to the communities that it serves in a cost effective manner. The hospital has experienced enormous changes in healthcare since its founding in 1919. While the hospital has kept pace with these rapid changes, its strength lies in the personalized healthcare given by the Brookville Hospital family, which includes the physicians, hospital employees, and the hospital Board of Directors. This tradition of close, personalized care extends back through the years to the hospital's founding.

Charles Cole Memorial Hospital

Charles Cole Memorial Hospital is a not-for-profit, rural community hospital located in Potter County in north central Pennsylvania. The hospital currently has 54 acute Medical/Surgical licensed beds. Licensed beds consist of a 38 bed Med/Surg Unit, a 6 bed ICU, and a 10 bed OB/GYN Unit, plus an 11 bed IRU and a 12 bed IBHU (which equals 77 current total licensed beds). Under separate licensure, Charles Cole Memorial Hospital also manages a 49 bed Long Term Care Unit. In addition, the hospital has affiliated satellite health centers.

Charles Cole Memorial Hospital marked its 30th anniversary in October 2002 but the origins of the hospital go back to October 1917, when Miss Margaret Tighe purchased the Dean Sanitarium and opened under the name of the Coudersport Hospital. Since then, the hospital has been committed to providing a comprehensive range of healthcare services, using the latest technology and treatments available. Their services include prevention and wellness, diagnosis, inpatient and outpatient treatment, rehabilitation, home health, and education.

Clearfield Hospital

Since 1901, Clearfield Hospital has been dedicated to providing quality health care to the people of Clearfield County, PA and surrounding areas. It is an 86-bed, not-for-profit, acute-care facility with a host of services second to none in the area and not usually found in hospitals this size. Expanding technology is offered in medical, surgical, and support services, including: emergency service; home health care with

seven satellite offices; hospice; intensive care/telemetry units combining critical and coronary care plus temporary pacemakers and hemodynamic monitoring; obstetrics; pediatrics; surgical suite; lithotripsy; ambulatory care unit; cardiopulmonary; cardiac rehabilitation; wound clinic; stereotactic breast biopsy; chemotherapy center; nuclear medicine (CT, MRI, PET scanning); laboratory services; pharmacy; occupational and physical therapy; sports medicine; social services; and community programs.

The mission of the Clearfield Hospital is to positively impact the health status of the region by providing quality healthcare coupled with quality service. The hospital continues to improve, looking to meet the changing heath care needs of the community.

Elk Regional Health System

In 1922, three daughters of the honorable Andrew Kaul recognized the need for a hospital to serve the area. They organized and helped finance a community fund drive to convert an empty monastery building into a modern, well-equipped, 38-bed hospital. Since then, the hospital has grown to a total capacity of 83 acute care beds. The Extended Care Facility, now known as Pinecrest Manor, is located on the St. Marys Campus and can serve a total of 138 residents for skilled nursing care. The newly developed “Generations” Gero-Psych Unit is a 10-bed inpatient psychiatric program serving individuals age 55 and over.

Elk Regional Health System is a fully accredited, not-for-profit, health care facility serving the residents in Elk and Cameron Counties, PA and the surrounding communities. The hospital offers a comprehensive range of services designed to meet the more active lifestyles, healthier living habits, and the changing health care needs of the communities it serves. Elk Regional Health System’s mission is to improve the health and well being of its communities.

Indiana Regional Medical Center (IRMC)

Resting in the heart of western Pennsylvania, Indiana Regional Medical Center offers the perfect blend of history and progress, industry and scenery, and culture and charm. When Indiana Regional Medical Center first welcomed the public in November 1914, it was a 40-bed facility with 13 private rooms. From the time of its opening, the hospital has had a mission to work in partnership with its communities and to strive to be the center for quality, accessible, cost-effective healthcare. The hospital is dedicated to promoting health and wellness through education and compassionate, caring services.

Over the years, Indiana Regional Medical Center has grown to become a 162-bed hospital and the county’s sole, full-service healthcare provider. Throughout its many renovations, expansions in services, and continued advancements in knowledge and technology, the hospital has remained unchanged in its commitment to serve the community.

Laurel Health System

Laurel Health System is a nonprofit, integrated health and human services organization providing primary care to the people of Tioga County, PA. Laurel Health System was created in 1989 through the affiliation of Soldiers and Sailors Memorial Hospital (SSMH) and North Penn Comprehensive Health Services (North Penn), a consolidation which resulted in a multifaceted system of health and human services, strengthened and unified under one umbrella. The mission of the Laurel Health System is to provide excellent services and improve the health and well-being of the communities it serves.

Laurel Health System has 83 licensed beds and offers a wide range of services for all age groups. From primary and acute care to long-term and preventive health services, it has continually expanded its capabilities to meet the changing needs of its patients. As it continues to grow, one thing will remain unchanged - its dedication to the health and well-being of the communities it serves.

Nason Hospital

Nason Hospital is a non-profit hospital that provides acute care to the Southern Blair and Northern Bedford County, PA region. It is licensed for 42 beds and provided services to 2,826 inpatients and 82,176 outpatients during the fiscal year ending on June 30, 2006. Nason Hospital's services include a home health care, a wound clinic, a pediatric practice, and an OB/GYN practice.

The mission of Nason Hospital is to operate as a not-for-profit, 501(c)(3) healthcare corporation that is governed by community leaders who are committed to the principles of quality, value, patient safety, pain management, and service to customers without regard to financial status. Nason Hospital's conception dates back to 1896, when Dr. Nason and six other Roaring Spring businessmen purchased the Park Hotel and established a private sanatorium.

Punxsutawney Area Hospital

Punxsutawney Area Hospital is an acute care hospital located in Jefferson County, PA. It has 49 licensed beds and has served the families and neighbors in its community for generations. Punxsutawney Area Hospital is a non-profit hospital, serving as a community health resource operating for the public benefit. The mission of the hospital is to provide high quality, cost effective, primary health care and to coordinate care for patients requiring secondary and tertiary services.

Titusville Area Hospital

Titusville Area Hospital is an 83-bed, acute care general hospital located in Crawford County, PA. The hospital opened as the "City Hospital" in 1901 and has been growing and changing to meet the needs of area residents since. It has earned a reputation for offering high quality, cost-efficient care and is committed to continuously enhancing medical services to meet changing needs. In 2001, Titusville Area Hospital received national recognition as a "100 Top Hospital" in the United States.

Titusville Area Hospital is a sole community hospital as designated by Medicare, with a service area population of 35,000. It is a community of professionals trained and devoted to caring for people. Highly skilled physicians, representing a wide range of specialties, are closely associated with the hospital. They are supported by an excellent staff of nurses, aides, technologists, and many others who play important roles in the care and treatment of patients. Titusville Area Hospital has 35 active medical staff, representing most of the basic medical and surgical specialists, and serves approximately 3,000 inpatients and 80,000 outpatients per year.

Appendix D

Telemedicine Experience and Interest in PMHA Hospitals

Telemedicine Experience and Interest in PMHA Hospitals												
	Tele-radiology	Tele-cardiology	Tele-lab	Tele-home health	Tele-pathology	Tele-OB	Tele-transcription	Tele-ICU	Physician remote access	Tele-pharmacy	Education-distance learning	Consultation with outside experts
Armstrong County Memorial Hospital	⊗		⊗		+		⊗	⊗	⊗		⊗	⊗
Bradford Regional Medical Center	⊗	+	⊗				⊗		⊗	+	⊗	⊗
Brookville Hospital	⊗		⊗	+	+		⊗		⊗	+		+
Charles Cole Memorial Hospital	⊗	⊗ +	⊗	⊗	+	+		+	⊗	+	⊗	
Clearfield Hospital	⊗		⊗	⊗								
Elk Regional Health System	⊗	⊗	⊗	⊗					⊗		⊗	
Indiana Regional Medical Center	⊗	+	⊗				⊗		⊗	+	⊗	+
Laurel Health System	⊗		⊗							+		
Nason Hospital	⊗ +		⊗						+	+		
Punxsutawney Area Hospital	⊗		⊗	+	*	+			⊗	+	*	
Titusville Area Hospital	⊗	*			+							* +

Key

⊗ - Telemedicine application is implemented

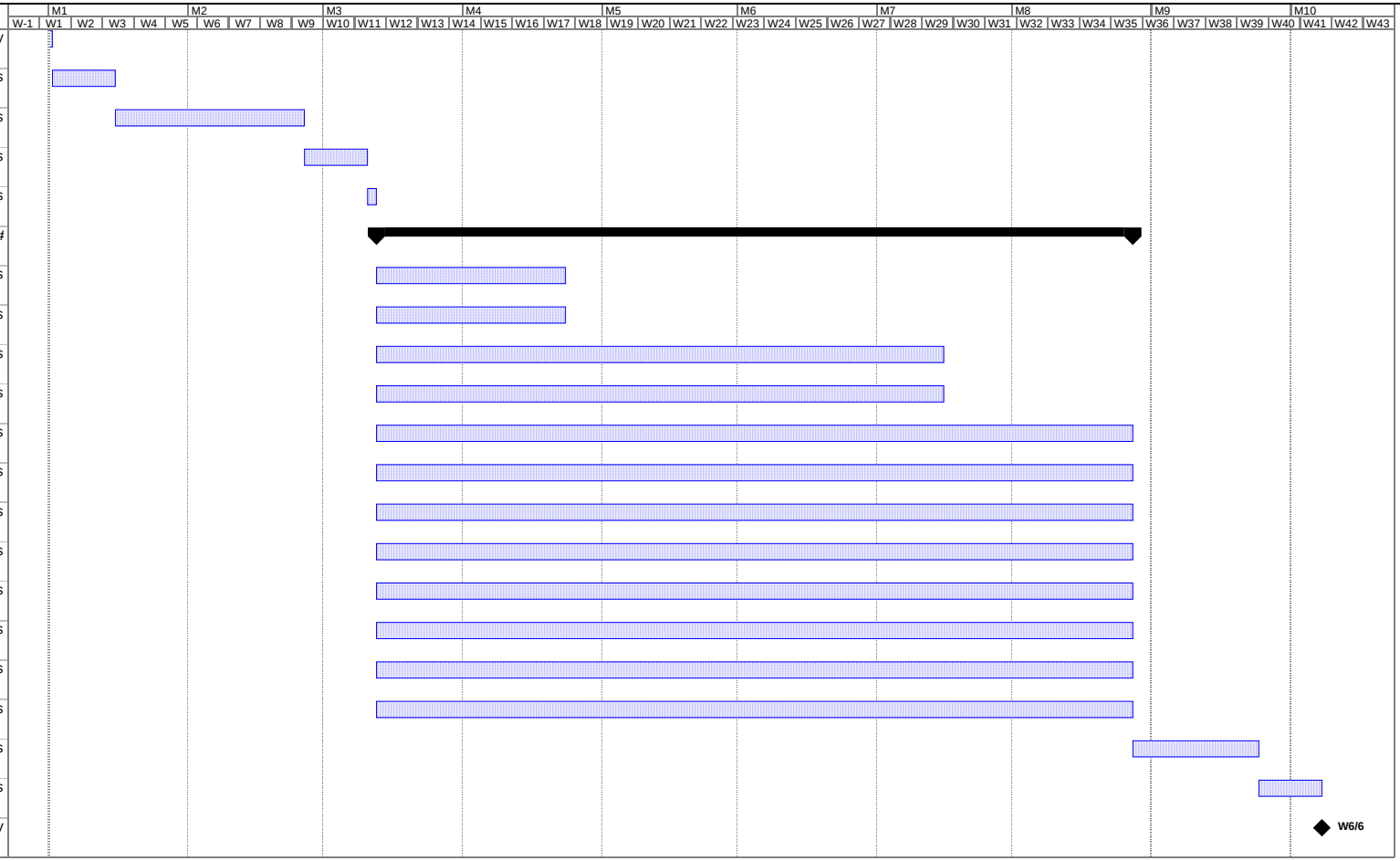
\+ - Telemedicine application is being planned for or there is interest in implementing or expanding its use

* - Telemedicine application was implemented in the past but is <u>not</u> currently implemented

Appendix E

Network Deployment Work Plan and Schedule

ID	Task Name	Duration
1	FCC Award of Rural Healthcare Pilc	1 day
2	Prepare & Submit 465 Forms	10 days
3	Supplier Review and Quote	30 days
4	Review Form 465 Responses	10 days
5	Award Contracts	2 days
6	**Delivery Cycle**	########
7	Charles Cole Memorial Hospital	30 days
8	Indiana Regional Medical Cente	30 days
9	Punxsutawney Area	90 days
10	Laurel Health System	90 days
11	Elk Regional Health System	120 days
12	Bradford Regional Medical Cent	120 days
13	Brookville Hospital	120 days
14	Clearfield Hospital	120 days
15	Titusville Hospital	120 days
16	PMHA Headquarters	120 days
17	Armstrong County Memorial Ho	120 days
18	Nason Hospital	120 days
19	Network Configuration	20 days
20	Testing	10 days
21	Network Operational	1 day



Project: PMHA Network Install.mpp
Date: Tue 5/1/07

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone